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ABSTRACT

This study examined the incidence of creativity among individuals with attention deficit hyperactivity disorder (ADHD) and the incidence of ADHD among individuals who are highly creative. The ADHD group consisted of 34 students, aged 6 to 15. The highly creative group consisted of 76 participants, ages 13 to 15, from the Torrance Creative Scholars Program in Louisiana. The ADHD group performed close to the test means on the Torrance Test of Creative Thinking-Figural Form A, on all components except elaboration. On elaboration, which is a measure of a style of creative response that gives attention to detail and perfects ideas rather than producing large numbers of ideas, the ADHD group scored more than one standard deviation above the test mean. Thirty-two percent of the ADHD group scored high enough on the Torrance Test to have qualified for the Creative Scholars program. The highly creative group completed the Swanson, Nolan, and Pelham Checklist (SNAP), indicating that 20 (26 percent) met the criteria for ADHD, attention deficit disorder with hyperactivity, or attention deficit disorder without hyperactivity, though SNAPS completed by their teachers reflected no elevated levels of hyperactivity, inattention, or impulsivity. The study concludes that a creative child could receive an unwarranted diagnosis of ADHD, and once a diagnosis is made, it is likely that behavior will be seen through that filter and so attributed. (Contains 33 references.) (JDD)

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•The Relationship Between Attention-Deficit
Hyperactivity Disorder and Creativity

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The Relationship Between Attention-Deficit Hyperactivity Disorder and Creativity

Because attention deficit hyperactivity disorder (ADHD) is a psychological classification that has undergone numerous changes in conceptualization and diagnosis over time (Meents, 1989) and place (Levine & Melmed, 1982), and because extant treatments for this disorder have shown limited and questionable long-term results (Meents, 1989; Silver, 1992), it is important for educators to look carefully at the behaviors that may warrant such a diagnosis and label for a child.

The primary identifying symptoms of ADHD are listed as inattention, impulsivity, and motor hyperactivity (Frick & Lahey, 1991). However, these key behaviors may be susceptible to varying interpretations because of situational variability and the viewpoint of the observer. Barkley (1990) has reported that there is very poor consistency among the best known measures for diagnosing ADHD.

This is of special concern to those interested in creativity because the very behaviors that may induce a diagnosis of ADHD have also been shown to have correlates in the literature on creative behavior (Cramond, in press). For example, Levine and Melmed (1982) have speculated that

the ADHD-type behaviors of distractibility, rapid cognitive tempo, and insatiability may be expressed in adulthood as flexibility in ideation, productivity, and ambition. In fact, Shaw (1992) found that a group of ADHD children had higher figural creativity scores than a control group matched for age, sex, and IQ.

Could creative children also exhibit behaviors typical of ADHD children? One can only imagine what type of children grew into the entrepreneurs that Winslow and Solomon (1987) described as risk-taking, action-oriented and energetic. The literature on the lives of creative individuals is replete with instances of their daydreaming, high energy, and impulsivity (Cramond, in press). In fact, Gallagher (1985) found that students with high scores on the *Torrance Tests of Creative Thinking--Figural Form* (Torrance, 1962) had higher scores on Psychomotor Overexcitability as measured by the Overexcitability Questionnaire (Piechowski & Cunningham, 1985). Such Psychomotor Overexcitability, which may be described as a high degree of physical activity and energy (Piechowski, 1986), may be observed as rapid talk, intense activity, restlessness, and impulsive behavior (Piechowski, 1979). In a classroom such behavior could warrant an ADHD diagnosis.

A review of the literature indicates that researchers writing

separately about ADHD or creativity often propose a possible etiology of the condition they are investigating that appears in research on the other condition. For example, there is evidence in both the literature on ADHD (Hynd, Hern, Voeller, & Marshall, 1991) and the literature on creativity (Herrmann, 1981; Torrance, 1984) implicating neurobiological anomalies as related to the respective conditions. Also, the in-born temperament trait of sensation seeking has been linked to both ADHD (Zuckerman, 1983) and creativity (Barron, 1988; Farley, 1981; Torrance, 1968).

Another interesting connection is apparent in the cognitive processing that results in ideation. Shaw and Giambra (1993) found that ADHD students reported a higher number of spontaneous, task-unrelated thoughts during a vigilance task than did controls. They interpreted this as an indication that ADHD students have more internal distractions from fleeting sensory input and less command over their thought processes than do others, especially during boring tasks. Shaw speculated that such spontaneous and diverse ideation may also be part of the process that fosters more creative responses on a test of divergent thinking (1992).

If such a relationship exists, then there should be a high incidence of creativity among individuals who are identified as having Attention-Deficit Hyperactivity Disorder. Also, there should be a high incidence of ADHD

symptoms among individuals who are identified as highly creative. This study was designed to investigate these possibilities.

Method

The ADHD sample is comprised of children from two sources. The first source is a psychological clinic that is operated through a large university. Children were referred for a variety of reasons ranging from behavior and learning problems to intellectual giftedness. All students who were available for two days of testing were administered the *Torrance Test of Creative Thinking--Figural Form A* (TTCT, Torrance, 1962) regardless of reason for referral. The TTCT was scored by a trained scorer who had reached the criterion inter-rater reliability of 90% or better. Scorers did not know the diagnosis of the child at the time the TTCT was scored. Children who were later found to have a diagnosis of ADHD were selected for the study. The other source was from a large suburban school system where all children identified as ADHD in several schools were tested on the TTCT if their parents so agreed. The ADHD group consists of 34 students, aged six to 15, 8 females and 26 males, who have been diagnosed with Attention Deficit Hyperactivity Disorder.

The highly creative group was comprised of 76 participants, 33 females and 43 males, from the Torrance Creative Scholars Program in

Louisiana. These are children from age 13 through 15 who scored above the 90th percentile on the *Torrance Tests of Creative Thinking--Figural Form A* (Torrance, 1962), and were invited to take part in a university based program for highly creative children. These children and their teachers completed the Swanson, Nolan, and Pelham Checklist (SNAP) (Pelham, Atkins, & Murphy, 1981) as a quick screening measure for behaviors indicative of ADHD. The SNAP checklists were then examined for cases that would meet the criteria of the third edition of the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-III, 1980) for diagnosing ADD with hyperactivity. After those cases were removed, the remaining SNAP checklists were examined for cases that fit the DSM III criteria for ADD without hyperactivity. Finally, the remaining checklists were reviewed and cases meeting the criteria for ADHD according to the DSM-III-R (1987) were removed.

The incidence of creative ability was measured in an ADHD population and the incidence of behaviors indicative of ADHD was measured in a highly creative population.

Results

The ADHD Group

Descriptives statistics and frequencies were calculated on the test

scores with the SPSS-pc program for the Macintosh. As can be seen in Table 1, the ADHD diagnosed group performed close to the test means on all components of the TTCT except elaboration. The Kolmogorov-Smirnov nonparametric test from the SPSS-pc package for the Macintosh indicated that the elaboration scores for this group differed significantly from the test distribution ($z = 2.92, p < .001$). On elaboration, which is a measure of a style of creative response that gives attention to detail and perfects ideas rather than producing large numbers of ideas, the ADHD group scored more than one standard deviation above the test mean.

Although the group performed at about the mean on the TTCT, there were some extraordinary scores (see Figure 1). Of the 34 students who were administered the TTCT, 11 students, approximately one third, scored above the 90th percentile, high enough to have qualified for the Torrance Creative Scholars program. Half of the students scored above the 70th percentile.

The Highly Creative Group

Of the 76 students in the highly creative group, their self report results indicated that 10 (13%) met the criteria for ADD with hyperactivity from the DSM-III (American Psychiatric Association, 1980) with high scores on at least 2 hyperactivity criteria, 3 inattention criteria, and 3

impulsivity criteria. One additional student met the DSM-III criteria for ADD without hyperactivity (high scores on ≤ 1 hyperactivity criterion, 3 inattention criteria, and 3 impulsivity criteria). When the DSM-III-R (American Psychiatric Association, 1987) criteria were applied to the remaining 65 SNAPs, nine students met the criteria for a diagnosis of ADHD by indicating high scores on at least eight symptoms regardless of category. All told, 20 of the 76 highly creative students, or 26%, also met the criteria for a diagnosis of Attention Deficit Disorder according to their self reports. (The data are summarized in Figure 2).

In order to determine whether this was significantly higher than would be expected, a Chi-Square was computed with 20 as the observed value and 2.28 as the expected value. Because most experts agree with an estimate of about 3% incidence of ADHD in the school age population (Frick & Lahey, 1991), the expected value was calculated by taking 3% of the 76 students. This statistic indicated that this number was much greater than would be expected in a representative sample of school age children ($X^2 = 137.72$, $df = 1$, $p < .001$).

The SNAPs completed by the teachers painted a very different picture of these students. None of the students showed elevated levels of hyperactivity, inattention, or impulsivity according to the teachers.

Discussion

The higher TTCT elaboration scores of the ADHD group are somewhat surprising because of Shaw's speculations that it is the spontaneity and diversity of ideation attendant to ADHD that increases creativity test scores (1992). This would lead one to expect higher fluency and originality scores, which with this group was not the case. In fact, Farley found that there was a curvilinear relationship between stimulation seeking and ideational fluency (1976) with high, but not too high levels of sensation seeking related to higher fluency. Perhaps the ideational fluency in this group was expressed as a higher number of details per idea rather than a higher number of distinct ideas. Or there may have been any number of reasons why this group performed as they did.

One mitigating variable may be intelligence. Torrance (1979, p. 65) reported that the elaboration score has consistently correlated higher than any of the other creativity scores with measures of school achievement. Six of the 11 students scoring above the 90th percentile on the TTCT had also been screened for or placed in a gifted program. Only one child from the group of 34 who had been screened for the gifted program did not score above the 90th percentile; she scored at the 81st percentile. Because identification for the gifted program in the state is primarily based on IQ,

this may indicate that intelligence may be an important variable to consider in the ADHD-creativity connection. Indeed, Shaw and Brown (Shaw, 1992; Shaw & Brown, 1990, 1991) tested high IQ subjects in the studies that indicated that individuals with ADHD also score well on tests of creativity.

However, the other five students who scored in the 90th percentile only had information about deficiencies, not proficiencies, in their records. For these five, one child had the additional diagnosis of a learning disability, one was deemed emotionally handicapped, and one seven year old was in a readiness class. Among the six students who were screened or placed in the gifted program, one was additionally labeled emotionally handicapped and one had a learning disability.

Clearly, school achievement and intelligence are not the only factors that are involved in their high TTCT scores. Perhaps, as Farley (1981) and Shaw (1992) have speculated it is the very qualities that are involved in the ADHD diagnosis that enable creative responses.

Certainly, the self-reported SNAPS of the highly creative group indicate a much larger percentage, at 26%, meeting screening criteria for ADHD than would be expected. According to Frick and Lahey (1991), estimates of the prevalence of ADHD in school-aged children range from 1-

12% with most authoritative sources estimating it at 3%.

What of the discrepancy between the students' self reports and the teachers reports? First, the SNAP was meant to be completed by teachers and parents. It is not possible to say how accurate these students' self-reports were. Lapouse and Monk (1958) found that children's self report measures often inflated pathological behavioral descriptions. However, these Creative Scholar students were old enough and bright enough to have some understanding of their own behaviors, and perhaps were the only people able to record what their behavior is like in different settings. In fact, one boy wrote on the SNAP, "I'm marking this like I usually am in school, not in this program."

This remark brings us to a second possible explanation for the discrepancy between students' self reports and the teachers reports. The teachers who completed the SNAP were the teachers from the Torrance Creative Scholars Program. Perhaps the fact that they did not witness the target behaviors in these students says more about the program than anything else. The Torrance Creative Scholars Program is a residential program for highly creative students that has a curriculum and faculty specially chosen to be stimulating, creative, open-ended, and active. If Farley (1981) is right, students would be less likely to exhibit signs of

ADHD in such a setting because the program meets their needs for high arousal. Without more evidence this is speculative, but the boy's written response gives some credence to this possibility.

What is of consequence here is that 32% of the ADHD group scored high enough on a test of creativity to have qualified for the Creative Scholars program and 26% of the Creative Scholars scored high enough on a measure of ADHD to have been diagnosed with that condition. Once a diagnosis is made it is likely that behavior will be seen through that filter and so attributed. Further research will have to answer the question: Is there more that differentiates these children than chance?

Conclusions

The most serious implication of the overlap of ADHD and creative behaviors is that a creative child receive an unwarranted diagnosis of ADHD. There are several concerns about labeling a child with Attention Deficit Hyperactivity Disorder; the ramifications of diagnosing a bright, creative child with ADHD may be dire. The most obvious are the effects of the labeling itself. There is the consideration of the negative effect on the child's self-esteem, and the possibility of removing responsibility from the child for his actions. This concern is heightened when the concept of labeling is subjected to a risks-benefits analysis. It has been argued that

because children labeled ADHD represent such a heterogeneous group with various co-morbid conditions, the label is not very helpful in providing specific recommendations for a specific child (Meents, 1989; Silver, 1992).

Of concern, too, are the immediate and long-term effects of medication on children, especially children who begin taking drugs at a very young age. There is reason to be concerned that the increase in attention and left hemisphere enhancement comes at price to cognitive functioning in other areas (Malone, Kershner, & Siegel, 1988). Although the increased attention helps the recipients of the drugs attend in school, we don't know the full implications of their losses in other areas.

There is evidence that there are other complicating factors associated with the use of methylphenidates, of which Ritalin is the most commonly prescribed for ADHD. One complication is the worsening or inducement of depression (Weinberg & Emalie, 1990). Other possible side effects include appetite reduction, insomnia, increased irritability, headaches, stomachaches, motor and/or vocal tics, and suppression of height and weight gain (DuPaul, Barkley, & McMurray, 1991).

Other complications of diagnosing bright, creative children with ADHD result from the recommendations for changing the school environment and curriculum for the child. Such recommendations

typically involve breaking the instruction into smaller components, making the environment more structured, and providing fewer distractions (Maxwell, 1989). For a bright child who delights in complexity and seeks stimulation, these recommendations may exacerbate the behaviors as he seeks to optimize the stimulation in his environment. In such a case one may see the behaviors worsening rather than improving.

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Table 1

ADHD Group Standard Scores on the Norm Referenced Component of the TTCT

	Mean	Standard Deviation
Fluency	99.79	19.51
Originality	103.77	21.55
Abstractness of Titles	103.56	20.27
Elaboration	128.65	23.69
Resistance to Closure	101.06	23.52
Overall Mean	107.37	15.20

n = 34

Note: All subtest scores on the TTCT have a mean of 100 and a standard deviation of 20.

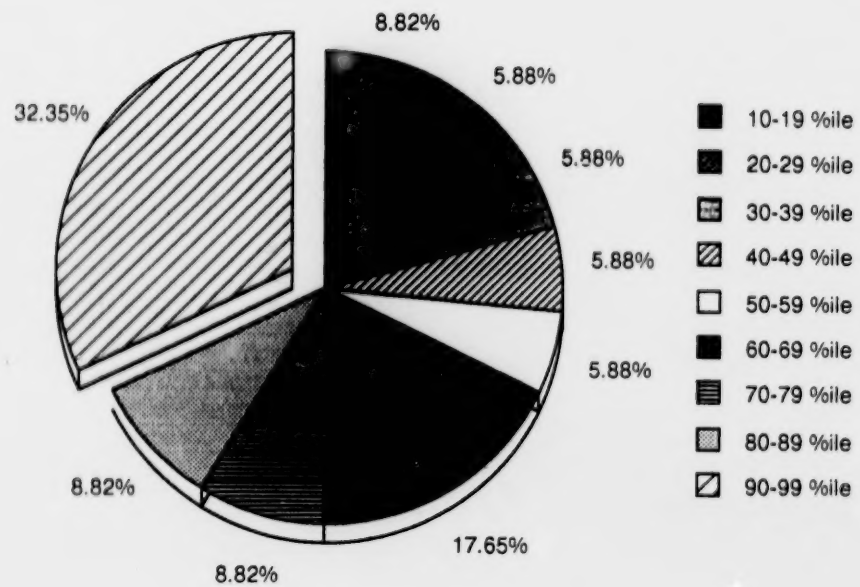


Figure 1. Percentile distribution of creativity scores for the ADHD group.

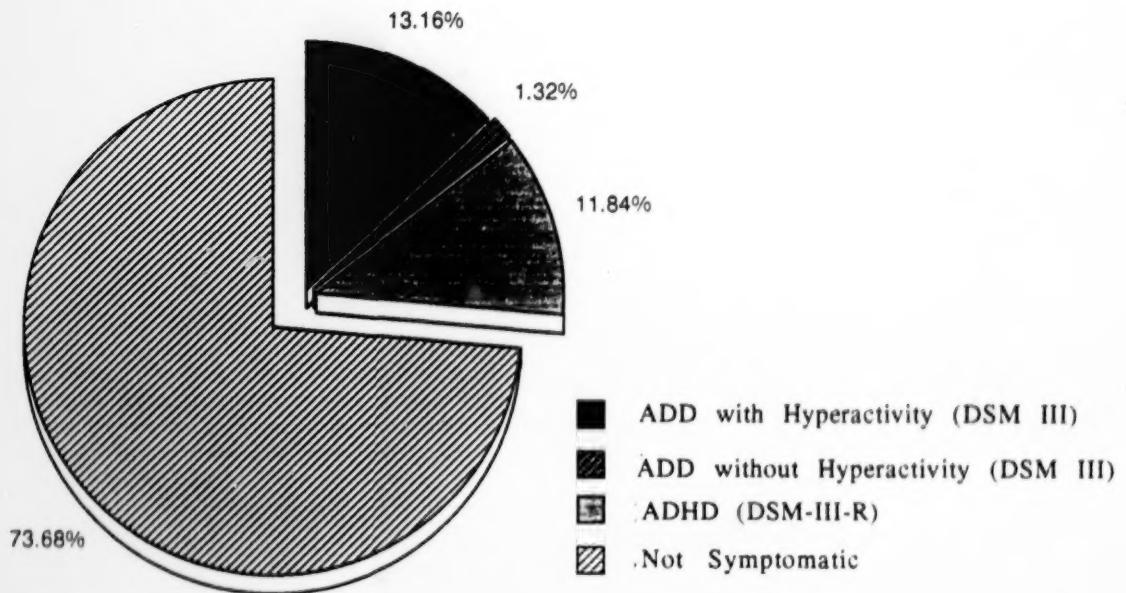


Figure 2. Frequencies of diagnosis for ADHD screening based on the SNAP self report with the highly creative group